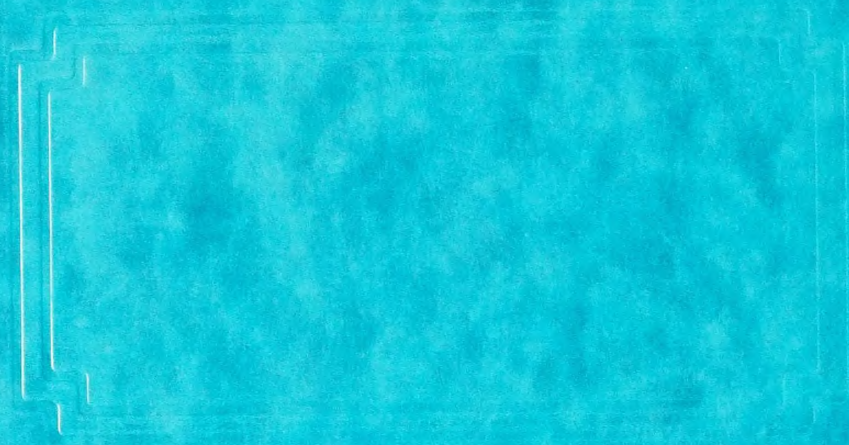


CAI  
ID  
-P66

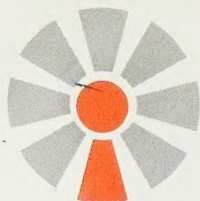
3 1761 11764176 1

Canada. Industry dept.  
News release









# NEWS RELEASE

DEPARTMENT OF INDUSTRY • OTTAWA CANADA

FOR IMMEDIATE RELEASE  
WEDNESDAY, JANUARY 12, 1966

IND 69/66

STATEMENT

BY

THE HONOURABLE C. M. DRURY  
MINISTER OF INDUSTRY  
CANADA

"THE ROLE OF GOVERNMENT IN STIMULATING TECHNICAL INNOVATION"

TO

THE SECOND MINISTERIAL MEETING OF SCIENCE

of

THE ORGANIZATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

PARIS, FRANCE

January 12 - 13, 1966



OECD MINISTERIAL MEETING ON SCIENCE - JANUARY 12-13, 1966

CANADIAN STATEMENT ON AGENDA ITEM IV -

"THE ROLE OF GOVERNMENT IN STIMULATING TECHNICAL INNOVATION"

by  
THE HONOURABLE C. M. DRURY  
Minister of Industry  
CANADA

At the outset, I should like to commend the Working Party on Innovation for their comprehensive Background Report analyzing the manifold aspects of government policy which have an impact on this important and complex problem. In this connection, I should also like to say here that we in Canada have found the earlier OECD reviews on science policy and organization very useful in formulating our own policies in this regard. Moreover, the compilation under OECD auspices of comparative statistical data on Research and Development should prove most helpful in appraising our individual performances and providing a basis for future planning.

The preceding discussions have highlighted the difficulties facing the smaller countries in upgrading their industrial technology, due to problems of scale, external competition, subsidiary industry, balance of payments, shortage of risk capital, etc. Accordingly, since we in Canada have been confronted with most of these problems, I thought it might be of interest to review here our experiences in grappling with them.



THE UNIVERSITY OF CHICAGO

DEPARTMENT OF CHEMISTRY

RESEARCH REPORT

THE UNIVERSITY OF CHICAGO  
DEPARTMENT OF CHEMISTRY  
RESEARCH REPORT

1. The object of this report is to describe the results of the work done in the Department of Chemistry during the year 1954. The work was carried out under the direction of Professor J. H. Ekin and was supported by the National Science Foundation and the University of Chicago.

2. The work was carried out in the Department of Chemistry, University of Chicago, during the year 1954. The work was carried out under the direction of Professor J. H. Ekin and was supported by the National Science Foundation and the University of Chicago.

3. The work was carried out in the Department of Chemistry, University of Chicago, during the year 1954. The work was carried out under the direction of Professor J. H. Ekin and was supported by the National Science Foundation and the University of Chicago.

4. The work was carried out in the Department of Chemistry, University of Chicago, during the year 1954. The work was carried out under the direction of Professor J. H. Ekin and was supported by the National Science Foundation and the University of Chicago.

5. The work was carried out in the Department of Chemistry, University of Chicago, during the year 1954. The work was carried out under the direction of Professor J. H. Ekin and was supported by the National Science Foundation and the University of Chicago.

6. The work was carried out in the Department of Chemistry, University of Chicago, during the year 1954. The work was carried out under the direction of Professor J. H. Ekin and was supported by the National Science Foundation and the University of Chicago.

7. The work was carried out in the Department of Chemistry, University of Chicago, during the year 1954. The work was carried out under the direction of Professor J. H. Ekin and was supported by the National Science Foundation and the University of Chicago.

8. The work was carried out in the Department of Chemistry, University of Chicago, during the year 1954. The work was carried out under the direction of Professor J. H. Ekin and was supported by the National Science Foundation and the University of Chicago.

9. The work was carried out in the Department of Chemistry, University of Chicago, during the year 1954. The work was carried out under the direction of Professor J. H. Ekin and was supported by the National Science Foundation and the University of Chicago.

10. The work was carried out in the Department of Chemistry, University of Chicago, during the year 1954. The work was carried out under the direction of Professor J. H. Ekin and was supported by the National Science Foundation and the University of Chicago.

### NATIONAL GOALS

In the broadest sense, government support for scientific endeavour is based upon the attainment of definite national goals. In the case of the larger nations, the requirements of Defence, Space, and Atomic Energy programs have resulted in massive financial support for research in these fields. These programs have undoubtedly stimulated many new scientific discoveries and inventions which have substantially raised the general level of industrial technology, and the resulting "fall-out" (or "spin-off") has frequently found commercial application.

In the case of the smaller or less-affluent nations the requirements of national defence or prestige do not loom so large and economic and social goals assume relatively greater importance. Under these circumstances, more direct methods for sponsoring scientific and technical endeavour in support of economic objectives would appear to be both necessary and practicable.

The Economic Council of Canada has called for the attainment of a real annual growth rate for the Canadian economy of  $5\frac{1}{2}\%$  per annum so as to sustain a rising standard of living and to provide employment for a rapidly growing labour force ( $3\%$  per annum) and to maintain a viable balance of international payments. In terms of technological effort,

## CHAPTER IV

THE FUTURE OF THE NATION

The future of the nation is a subject of great importance to all of us. It is a subject which has been discussed for centuries by philosophers, statesmen, and writers of all kinds. In the past, the future of the nation has been seen in terms of the fate of the individual. The individual has been seen as the unit of the nation, and the nation has been seen as a collection of individuals. But in the future, the nation must be seen as a single entity, a single organism, a single being. The nation must be seen as a whole, not as a collection of parts. The nation must be seen as a single entity, a single organism, a single being. The nation must be seen as a whole, not as a collection of parts. The nation must be seen as a single entity, a single organism, a single being. The nation must be seen as a whole, not as a collection of parts.

In the past, the future of the nation has been seen in terms of the fate of the individual. The individual has been seen as the unit of the nation, and the nation has been seen as a collection of individuals. But in the future, the nation must be seen as a single entity, a single organism, a single being. The nation must be seen as a whole, not as a collection of parts. The nation must be seen as a single entity, a single organism, a single being. The nation must be seen as a whole, not as a collection of parts. The nation must be seen as a single entity, a single organism, a single being. The nation must be seen as a whole, not as a collection of parts.

The future of the nation is a subject of great importance to all of us.

The future of the nation is a subject of great importance to all of us. It is a subject which has been discussed for centuries by philosophers, statesmen, and writers of all kinds. In the past, the future of the nation has been seen in terms of the fate of the individual. The individual has been seen as the unit of the nation, and the nation has been seen as a collection of individuals. But in the future, the nation must be seen as a single entity, a single organism, a single being. The nation must be seen as a whole, not as a collection of parts. The nation must be seen as a single entity, a single organism, a single being. The nation must be seen as a whole, not as a collection of parts.



the attainment of the above economic goals will call for a major expansion of R&D activity in manufacturing industry in order to increase productivity and make our goods more competitive in both domestic and export markets.

Accordingly, we have projected a target growth rate for industrial R&D of 20% per annum (i.e. double the present long-term growth rate) so as to triple the current level of industrial R&D activity by 1970 and achieve an overall "research intensity" of 3% of net industrial output. Obviously, a "quantum jump" of this magnitude will require extraordinary measures in the form of government policies and incentives to achieve the desired result, and I now propose to discuss our current plans in this regard.

#### POLICY AND PRINCIPLES

Our basic premise is that "technological investment" is the great progenitor of economic growth. Technology enters the economy through the process of innovation which is one of the important driving forces of a modern industrial economy. The task facing governments then, is to stimulate the innovation process so as to ensure the rapid and effective exploitation of new scientific and technological advances. The solution involves the creation of a favourable climate for innovation and the devising of techniques to promote research and development in industry, where it can be applied for economic purposes.

The Commission on the Status of Women, established in 1946, was the first of its kind. It was created by the Economic and Social Council of the United Nations. The Commission's mandate was to study, promote, and defend the rights of women and to advise the United Nations on all matters relating to the status of women.

Over the years, the Commission has played a significant role in the advancement of women's rights. It has held numerous sessions, during which it has adopted resolutions and recommendations that have influenced national policies and international law. The Commission's work has been instrumental in the development of the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW), which is the most comprehensive international treaty on women's rights.

### THE COMMISSION ON THE STATUS OF WOMEN

The Commission on the Status of Women was established in 1946 by the Economic and Social Council of the United Nations. It was the first of its kind, and its mandate was to study, promote, and defend the rights of women and to advise the United Nations on all matters relating to the status of women. The Commission has held numerous sessions, during which it has adopted resolutions and recommendations that have influenced national policies and international law. The Commission's work has been instrumental in the development of the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW), which is the most comprehensive international treaty on women's rights.



The process whereby scientific knowledge is put to practical use does not happen automatically and research is only the beginning of the long and costly process of developing a new product. The process of "innovation" starts with the inventor to recognize a need and the means to satisfy it, and is completed by the entrepreneur who organizes and finances the development and exploitation of the invention. Hence, any program designed to foster technological growth must take into account the development as well as the research phase and should recognize the key role of the entrepreneur.

It is sometimes argued that the ready availability of imported technology makes it unnecessary for the smaller nations supporting any substantial R&D effort. A policy of reliance on licensing or imitation is of course much less costly in the short run but carries with it serious limitations on the future viability and growth potential of the dependent industry which thus becomes vulnerable to competition, (both domestic and international). Active engagement in R&D seems the best way of avoiding obsolescence and enabling a firm to successfully assimilate and exploit new technology.

Subsidiary industry often performs a useful function in bringing new technology into an under-developed industry or country. However, if they are to make their full contribution to the nation's economy, some degree of specialization (or rationalization) as between parent and subsidiary





may be desirable and new product development would appear to offer a practicable way in which this can be accomplished. Thus, by assuming full responsibility for research, development, and design of selected product lines, and supplying the total corporate requirements thereof, the benefits of scale and integration can be retained in the subsidiary operation.

To recapitulate then, we subscribe to the following principles with respect to the stimulation of technical innovation in a "free enterprise" economy:

- (i) The practical exploitation of science and technology is best performed by industry.
- (ii) Government policies designed to stimulate innovation should be responsive to the needs of industry and should provide the maximum opportunity for the exercise of entrepreneurial initiative.
- (iii) Measures to promote innovation should embrace developmental as well as research activity.
- (iv) For the smaller countries, some specialization of effort will be required in order to achieve and maintain a technically competitive position. In selecting areas of specialization, economic and commercial considerations as well as technical factors must be taken into account.





There are evidently many ways, both direct and indirect, in which government policies influence the innovation process. In recent years, modern governments have become major sponsors of industrial research and development, usually through the mechanism of contracts, grants, loans or fiscal incentives. The indirect methods would include education, dissemination of scientific and technical information, patent policy, tariff protection, procurement practice and taxation policy. The latter have been amply described in the Reference Papers compiled by the Working Party and therefore I shall confine my remarks here to the various techniques of direct financial assistance which are being employed in Canada and which, in some respects at least, differ from the practice in other OECD countries.

#### FINANCIAL ASSISTANCE FOR INDUSTRIAL R & D

In the final analysis, the limiting factor on the level of R&D supported by industry is its high cost coupled with the substantial risk of failure. I believe that government can best encourage industry to expand its innovation activity by providing financial incentives or underwriting costs. Recognizing the importance of science and technology to Canada's economic well-being, the Canadian government has in recent years introduced several measures designed to deal with the special problems and needs of Canadian industry in this regard.





In all cases, the primary objective is to introduce scientific knowledge and the associated technical skills into industry where they can be directly exploited for economic ends. Moreover, in all of these programs project selection is the firm's prerogative and participation is open to all companies incorporated in Canada without discrimination as to industry, size, ownership or profitability.

#### GENERAL R & D INCENTIVES

The general incentive is intended to create a favourable climate for the expansion of R&D activity in Canadian industry. To be effective, such an incentive must be generally available to all firms, should cover the broad spectrum of innovation activity from basic research to engineering development and should be free of governmental intervention.

In Canada, since 1961 the Income Tax Act has permitted 100% depreciation of capital costs for research purposes in the year incurred in addition to the deduction of all current expenditures. However, this measure did not produce the desired result so that it was reinforced in 1962 by the introduction of a tax incentive whereby corporations were able to deduct from their taxable income an "additional allowance" of 50% of the amount by which their expenditures on scientific research exceeded their total expenditures for this purpose in the 1961 base year. This provision was made for an initial period of 5 years and, where full advantage could be taken,





effectively reduced the cost of new R&D effort to 25 cents on the dollar.

This incentive has apparently had a significant effect on the expansion of R&D expenditure by Canadian industry. Statistical evidence over the first two years of its operation indicates that capital expenditures rose by the remarkable figure of 120% between 1961 and 1963. In the case of current expenditure, the overall rise in company-financed R&D was 35% (16% per annum) which includes the combined effects of normal growth (about 10% per annum) and cost-shared research as well as the tax incentive.

However, the use of taxation as a vehicle for subsidizing R&D effort is essentially discriminatory since eligibility depends on the firm's tax position. Under these circumstances, many small or growing firms which are not in a profit-making position (but which perhaps have the greater need for R&D assistance) are excluded. Thus, in 1963, only 265 out of a total of some 600 firms performing R&D were able to claim benefits under the additional allowance. Hence, in order to broaden the availability of the general incentive, it has now been decided to remove it from the Income Tax Act and to provide a system of statutory grants (or credits against tax liabilities) for which all firms performing R&D could qualify. This new program will be known as the "General Incentive for Research and Development" (GIRB) and will be administered by the Department of Industry.





The level of benefits under the new program which begins in 1966 will be broadly equivalent to those previously available under the tax incentive. In order to foster the provision of new laboratories and better equipment for industrial research, all capital expenditures will qualify for a 25% bonus. A 25% bonus will also apply to operating expenditures, but since the basic objective is to encourage expansion of R&D effort, the "additionality feature" of the tax incentive will be retained. Thus, the bonus on operating expenditure will be based on the incremental expenditure over the average of the preceding 3 years. These grants will of course not be taxable.

#### SPECIFIC R & D ASSISTANCE PROGRAMS

While the general incentive serves to create a favourable environment for the expansion of industrial R&D activity, it does not meet the needs of all situations, particularly the financial problems of small or new or growing industries. To ensure that no worthwhile development projects lack financial support, the general incentive must be reinforced by specific incentives in the form of direct financial assistance. Specific assistance programs are inherently more selective than the general incentive and provide a substantially higher level of support (up to 50% of cost). They are intended to accomplish one or more of the following objects: to induce new or small firms to engage in research and development; to enable established firms to



expand their R&D activities; to foster projects involving high technical risk; to help obsolescent industry diversify into more sophisticated forms of production; or to support cooperative R&D programs.

Our specific assistance programs are intended to be responsive to the needs of industry, therefore responsibility for the selection of projects and their direction rests with the firm. In all cases, costs of the research or development are shared with the manufacturer in accordance with the principle that the firm which expects to benefit therefrom should have a substantial stake in the endeavour.

In providing financial assistance of this nature, the government does not require security in the form of assets or acquire ownership equity in the firm. In the case of research projects, the government's contribution is in the form of an outright grant, but for development projects which achieve commercial exploitation, repayment is required so as to avoid distorting the normal pattern of commercial competition. However, since the object is to stimulate industrial progress for the benefit of the economy generally, no attempt is made to earn profits from successful projects or to make the program self-sustaining.





Industrial Research Assistance Program

An Industrial Research Assistance Program was established by the National Research Council in 1962. The purpose of the program is to stimulate the interest of Canadian industry in scientific research by promoting the establishment of new industrial research teams or the expansion of existing research groups. The initiative in project selection rests entirely with the firm, and the National Research Council assesses the program on its scientific merits and if required, provides advice and assistance from its own laboratories. The NRC contribution is made in the form of a grant which pays the salaries of new or additional scientific and technical personnel, while all other costs must be borne by the firm.

Program for the Advancement of Industrial Technology

The newly-established Program for the Advancement of Industrial Technology (PAIT) sponsored by the Department of Industry is designed to promote the application of scientific and technological advances to the development of new products or processes for the commercial market. Essentially, PAIT is a form of "development insurance" for underwriting selected development projects which involve a significant technical advance and which offer good prospects for commercial exploitation.





The initiative for proposing development projects and responsibility for their direction rests with industry. All relevant costs of the project are shared equally by the government and the firm. In the event the project is successful and the results are brought into commercial usage, the firm is required to repay the government's contribution with interest and repayment may extend over a period up to 10 years. However, if the project is unsuccessful, payback is waived. Proprietary rights resulting from the development project are vested in the firm, which is of course expected to exploit the results of the project in Canada.

#### Civil Development Contracts

All of the foregoing discussion related to the general case where the government was not a customer for the end-product. However, where the government is a major user, it is in a position to establish requirements or specifications for the products it buys which will encourage advancement over the current state-of-the-art. In this case, the cost of the R&D effort involved is underwritten either directly by means of development contracts or indirectly by inclusion in the selling price of the end-product. This follows the technique employed in the development of military equipment which latterly has been extended into the civil (or non-defence) fields of government operations. For instance, Atomic Energy of Canada Ltd. currently expends about 10% of its operating budget on development contracts with private



industry in support of its power reactor programs. Similarly, our Department of Transport recently commissioned an experimental ground station for satellite communications which involved significant advances in microwave technology.

#### CONCLUDING REMARKS

In the foregoing, I have described the various techniques which we have devised in order to overcome Canada's "technological lag". As yet, we have not had sufficient experience to assess their absolute effectiveness and therefore they must still be regarded as experimental, and subject to verification or modification. Consequently, we endorse the proposal that OECD should evaluate the experience of Member governments using different techniques for stimulating innovation in industry. Similarly, we strongly support the continuing study of the relationship between science and economic growth which was advocated at the previous Ministerial Meeting in 1963.

For further information:  
J. A. Murphy  
992-8097







# NEWS RELEASE

DEPARTMENT OF INDUSTRY • OTTAWA CANADA

DEPUTY DIRECTOR,  
MECHANICAL TRANSPORT BR.

FOR RELEASE AT 2 P. M. (EDST)

MONDAY, MAY 29, 1967

"CANADIAN COMMERCIAL POLICY IN PERSPECTIVE"

AN ADDRESS BY

THE HONOURABLE C. M. DRURY

MINISTER OF INDUSTRY

TO THE WORLD TRADE CONFERENCE

AT 96th ANNUAL MEETING

OF THE CANADIAN MANUFACTURERS' ASSOCIATION

IN TORONTO

MONDAY, MAY 29, 1967







I can think of no more fitting and important topic for discussion at your Annual General Meeting during Canada's centennial year than world trade. Our development into a prosperous industrially advanced nation has been intimately bound up with international trade. And there is little doubt that with the ever increasing sophistication of modern industrial technology and its emphasis on large-scale production, our dependence on world trade will continue in the years to come.

The celebration of the 100th anniversary of our birth as a nation coincides almost to the day with the conclusion of the most ambitious attempt ever made to lower barriers to world trade. The results of the Kennedy Round will provide the basis for a further substantial expansion of trade among nations. If we skilfully exploit the new trading opportunities opened to us by the results of the Kennedy trade agreements, the benefits for Canada will be considerable.

Under these circumstances, it is only proper to ask ourselves what policies we should adopt to take full advantage of the changes in our industrial and trading environment. I happen to be one of those who believes that in order to plan for the future, we must, first of all, understand the past. I should like to begin, therefore, by reviewing briefly the principal aspects of our commercial policy during the first century of our nationhood.



Canada inherited a tariff structure from pre-Confederation days. This tariff structure was designed chiefly for revenue purposes and its over-all level was relatively low. It was not until the introduction of the National Policy in 1879 -- twelve years after Confederation -- that Canada acquired a tariff designed primarily to protect domestic industry from foreign competition and to stimulate its expansion. With minor variations, the protective policy adopted at that time remained in effect until the early 1930's, culminating with the tariff increases of 1930 and 1931 intended to insulate Canada from the effects of the Great Depression. Both in 1879 and in the early 1930's, unemployment was widespread. Substitution of domestic production for imports was expected to lead to increased employment in protected industries. Unfortunately, this policy did not achieve the short-run objectives expected of it.

However, the protective measures initiated with the National Policy did have an important long-term effect on the development and the structure of our manufacturing industry. They resulted, in many instances, in the virtual duplication on a much smaller scale of United States industry in Canada. Combined with the relatively small size of the Canadian market, the proliferation of firms and products resulted during these early years in the establishment in Canada of a manufacturing sector producing behind a tariff barrier primarily for the domestic market and, with some exceptions, unable to compete





abroad. In fact, it has been suggested that the number of firms in any one Canadian industry varies in direct proportion to the height of the Canadian tariff; although uttered in jest, the statement is not far from being accurate.

Our protective tariff policy has had another effect. It has lent encouragement to industrial investment in Canada. Part of this increased investment has been made by foreign corporations who have set up operations in Canada to gain easier access to the Canadian and Commonwealth markets. Thus, while total industrial investment has been stimulated, there has been, at the same time, an increase in foreign ownership and control of our manufacturing industry.

Given our political aspirations, trading environment, and the state of industrial technology prevailing during the early years of our nationhood, the adoption of a protective commercial policy may have been the only practical method to stimulate broadly-based industrial development. There is no doubt that living, as we do, next door to a large and advanced industrial nation, we might otherwise have been confined to the proverbial role of hewers-of-wood and drawers-of-water. Such a role was obviously just as unacceptable to our forefathers as it is today to those who shape the destiny of the newly developing nations. In retrospect, however, it seems that no matter how vital our protective commercial policy has been



to our development into an industrial nation, it was not designed -- nor would it have been capable of -- preparing us for the challenges and opportunities which we face during the second half of the 20th century.

Since the war, Canada has, on the whole, followed a policy of multilateral reductions in tariff and other trade barriers within the framework of the General Agreement on Tariffs and Trade. We played a leading role in the formation of GATT in the early post-war years, and have participated in all the tariff negotiations which have taken place under it, culminating in the Kennedy Round which has just been successfully concluded.

As a result of all these GATT trade negotiations, the levels of protection under the Canadian tariff have been reduced. The pre-Kennedy position was that the average level of protection on dutiable imports had declined to about  $17\frac{1}{2}$  per cent, compared to the high of 30 per cent during the depression year 1932. In addition, it must not be forgotten that more than half of our imports enter duty free. Similar reductions have taken place in the tariff barriers of other countries participating in GATT. In the case of the United States, our most important trading partner, the average tariff level for dutiable imports had declined from more than 50 per cent in the early 1930's to about 12 per cent before the Kennedy Round. These average rates will be further reduced





as a result of the Kennedy Round negotiations, for Canada and for our trading partners.

Much as I would like to, I am not able to give you the details of the Kennedy Round results as they affect Canada. These results will be made known simultaneously to all participating countries towards the end of June. I am confident, that when you see the detailed results, you will not be displeased with the increased trade concessions we have received. Of course, you will appreciate that to obtain these benefits, we have had to make some tariff reductions as well.

What has been the result of the concerted effort towards liberalization of world trade in post-war years? In marked contrast to the stagnation of world trade in the period between the first and second world wars -- when many countries followed protective policies -- the volume of trade in post-war years has grown rapidly and steadily. This has been combined with a relatively rapid and sustained economic growth of the countries actively participating in world trade. These parallel developments have led to the increasing realization that there is a close relationship between trade expansion and economic growth. In its last report, the Economic Council of Canada had this to say:

"Historical experience indicates that a relatively free flow of international trade is an important, in fact an essential, ingredient in the high growth process for developed countries."



Moreover, as the Council points out, the basic connection is between the growth of trade and productivity, rather than between trade and total output. This, of course, has extremely important implications: productivity is the kingpin of economic progress and a rising standard of living.

It is noteworthy that manufactured products, rather than primary commodities, accounted for most of the expansion in world trade in post-war years. In our own case, highly manufactured products have become a major element in our export trade for the first time in our history. Their value more than tripled between 1960 and 1965 alone, from just over \$400 million to \$1.3 billion. Their share of Canadian exports roughly doubled in this period, from 7.8 per cent to 15.3 per cent. This suggests that our manufacturers have become increasingly competitive in foreign markets.

I am not unmindful, of course, that there have been special factors contributing to this result. I am thinking of such developments as the automotive program, defence production sharing, expanded export credits, substantial and successful promotion efforts abroad and a favourable external value for our currency. While the reduction of tariff barriers abroad may be an essential condition to the expansion of our exports, it is not of itself sufficient to guarantee this result. Given our industrial structure and the unique relationship between Canadian industry and that of our major trading





partner, the U.S.A., we must always be conscious of the need to remove complex and deeply rooted institutional barriers as well.

What lessons for the future can we derive from our experiences during the first 100 years? While the protective policy of the early years may have served us well in giving us a broad industrial base, there is no doubt that Canada's growth in the future will depend to an increasing extent on our ability to gain access to larger markets for those products which we can manufacture competitively. I believe that most Canadians will not find it difficult to agree that our long-run interests lie in the direction of world trade expansion. Any differences of opinion that still exist relate largely to the best means of achieving this objective.

The successful conclusion of the Kennedy Round may well mark the end of the post-war type of approach to the reduction of tariff barriers. It is now widely believed that if we are to make further progress towards this end, new ways for liberalizing world trade will be required. Some of these, such as the customs union used by the European Economic Community, or the free trade area employed by the European Free Trade Area, offer possible alternatives; others, such as an industry-by-industry approach, are also considered. I should like to comment on some of these, in so far as they may be relevant to Canada.



To begin with, what about a North American customs union or free trade area? Considering the amount of discussion this subject is receiving today, it might be wiser for me to restrict myself to generalities. Perhaps so, but I would feel unworthy of your invitation to speak to you today if I did not offer a view on this subject, which is of such importance to you. A North American free trade area is only one of various ways towards freer trade and, in my opinion, not necessarily the most suitable for Canada, or the one most likely to produce the best maximum results.

Many of the fastest growing markets for our products are overseas. For example, much of the future growth of demand for pulp and paper will be in Europe and Japan, not in North America. If one looks at our economic potential, product by product, I think one is bound to reach the conclusion that a North American club is both a little too exclusive for our taste and very much a second best in economic terms. For the present at least, I think we would be wise to continue our policy of pursuing a multilateral approach. I am pleased to note that my conclusion does not differ from that expressed in your recent submission to the Government of Canada in connection with the annual budget.

The possibility has been raised of applying the principles of the Canada-United States Automotive Agreement to other industries. It must be recalled, however, that the





automotive program was devised to meet a rather unique set of circumstances and, as such, is not directly applicable to other industries. It may be possible to devise variations of this approach suitable for one or more other Canadian industries. The point I would like to make in this context is that we should not feel hidebound by any particular line of approach, but should be willing to let our imaginations roam and be willing to examine any approach which holds promise for solving the problems of Canadian industry. I regard these as essentially practical problems requiring a pragmatic approach.

The fact that our commercial policy is aimed in the direction of expanding world trade is, I think, clear. It would, however, take a greater gift of prescience than I possess to predict the exact forms in which these liberalizing tendencies will be expressed. It may well be that in the years to come we shall have to adopt what my colleague, the Minister of Finance, has referred to as "a new and radically different approach to the reduction of trade barriers". I believe, as he does, that, in any event, we and the other industrial countries should begin to look at complete sectors of industry where tariffs can be removed completely, or can be at least substantially reduced.

I have heard the view expressed that we have gone about as far as we should go and that we should leave well



enough alone. I do not believe that such a course provides a satisfactory alternative. We simply cannot afford to stand still while the rest of the world is surging ahead.

As Minister of Industry, I am concerned that our commercial policy be such as to encourage the vigorous growth of Canada's manufacturing industry. Because it can be closely tailored to conditions which prevail in specific industries, or sectors of the economy, commercial policy is a valuable tool for promoting the growth of efficient, internationally competitive industry in Canada. We have used it for this purpose with some measure of success in the past and we will undoubtedly make use of it in the future. The pursuit of a dynamic and progressive commercial policy does place increased responsibilities on government, as well as business. Those of us in government, concerned with commercial policy, must acquire an increasing understanding of its impact on the various sectors of industry. We have embarked on a program intended to identify the sectors which have a potential for growth. To do this effectively, we will need your support and cooperation.

Apart from the responsibility for the formulation of commercial policy, the government can serve industry in many other ways. Time will not permit me to list these at length here. However, we are talking about growth and change and trade expansion and competitiveness. In this connection,





I regard as specially important the fact that my Department has underway a number of programs specifically designed to stimulate research and development, so that Canadian industry will have the capacity and technical competence to compete at home and to search out and penetrate world markets.

Finally, we come to the problems of adaptation and adjustment associated with changes in the trading environment. In recent years, the governments of a number of industrial countries have adopted measures and programs to ease adjustments brought about by reductions in trade barriers and other changes. These include the United States, the United Kingdom, France, West Germany, and other European countries, either acting singly or as members of such joint undertakings as the European Coal and Steel Community, the Benelux Customs Union and the European Common Market.

For example, fifteen years ago, the treaty setting up the European Coal and Steel Community provided for the financing of new and economically sound activities, and for the conversion of existing enterprises to other lines of production. This treaty also provided adjustment assistance for workers in the form of various allowances and vocational training.

A little later, in 1953, the Benelux countries established a government fund to finance transitional assistance for firms subject to certain import competition, and also to finance research into the amalgamation of such firms with a view to increasing productivity.



When the European Common Market was formed a decade ago under the Treaty of Rome, two institutions were created to deal with problems of adjustment. One of them, the European Investment Bank, was set up to facilitate both regional development and projects which, by their size and nature, could not be entirely financed by a member state. The other institution, the European Social Fund, was set up for the purpose of ensuring the productive re-employment of workers by means of occupational retraining and resettlement allowances; compensation for partial or complete unemployment was also provided. Expenditures under this Fund, and from similar funds provided under the Coal and Steel Community arrangements, were substantially less than expected. Fortunately, for these countries, the process of adjustment proved considerably easier than had been anticipated. The progressive reduction of barriers was accompanied by high levels of economic activity and employment, so that smooth shifts in patterns of production and trade were facilitated.

In addition to these international arrangements, many European countries have adopted national measures and programs to assist structural adjustment. Programs of this type, however, include loans and guarantees, grants, tax concessions, technical assistance and allowances and training for workers.





In the United States, public assistance for adjustment to tariff changes was authorized under the Trade Expansion Act of 1962. The assistance authorized for eligible firms is in the form of technical assistance, loans, and tax concessions through the carry-back of losses. For eligible workers, the Act authorizes special assistance in the form of retraining, grants for partial or complete unemployment, and relocation allowances. While the intent of the Act is clear enough, it has not yet been used to provide adjustment assistance to any significant extent.

Altogether, it is evident that measures and programs of adjustment assistance, arising from tariff changes and otherwise, have become a significant feature of public policy in many advanced industrial countries over the last decade or so. The basis in logic for this development is that the public interest and fundamental questions of equity are both involved.

The public interest is involved because the primary objective of reducing barriers to trade is to help create a more favourable climate for economic growth and for realizing the benefits of productivity increases, greater specialization and larger scale production. Similarly, the purpose of adjustment assistance is primarily to serve the national interest by speeding and smoothing changes which will benefit the economy as a whole.



The question of equity is also involved because some hardship may follow changes in the trading environment, although it is encouraging to know that in Europe adjustments to shifts in production and trading patterns proved easier than had been expected. In any event, it would be inequitable to expect particular firms and individuals to bear alone the whole burden of a policy designed for the benefit of the country as a whole. It seems only fair that the costs of adjustment should be spread more evenly over the economy.

In Canada we have been gaining valuable experience from adjustment assistance now being provided to firms and workers in connection with the Automotive Program. This assistance is administered by the Adjustment Assistance Board, which reports to me as Minister of Industry. You may be interested to know that to date some 40 firms in the automotive industry have received loans under this program to a value of some \$30 million, and we are continuing to receive applications. On the whole, this program is serving its purpose. We have sought to operate it in accordance with the positive principles to which I have referred. I can say that we are pleased with the results so far achieved. I believe industry is also pleased.

As the Kennedy Round was drawing to a close, we had expressions of opinion from various sectors of the Canadian economy concerning the desirability of extending adjustment assistance to other Canadian industries. No doubt you are aware



that the Department of Industry Act charges the Department of Industry with responsibility for assisting "the adaptation of manufacturing industries to changing conditions in domestic and export markets". It will not come as a surprise to you to know that careful consideration is being given in my department to this important question, and a number of interesting ideas have been developed. With the successful conclusion of the Kennedy Round, I have asked my officials to step up the pace of the work. I would like to take this occasion to say that I would welcome receiving your thoughts and advice on this subject.

This is all I have to say for the present. I hope that these remarks will serve as a useful background for the discussion to follow.







# **NEWS RELEASE**

DEPARTMENT OF INDUSTRY • OTTAWA CANADA

AN ADDRESS

BY

THE HONOURABLE C.M. DRURY

MINISTER OF INDUSTRY

ON

"GOVERNMENT AIDS FOR TECHNICAL INNOVATION BY CANADIAN INDUSTRY"

AT

CANADIAN RESEARCH MANAGEMENT ASSOCIATION

5TH ANNUAL CONFERENCE

SHERIDAN PARK RESEARCH COMMUNITY

OCTOBER 4, 1967.



I can assure you Mr. Chairman that I did not require any persuasion at all to accept the invitation extended by your distinguished Founder-Chairman, Dr. Norman Grace, to participate in this Fifth Annual Conference of the Canadian Research Management Association. For, quite apart from being privileged to speak about the Federal Government's policies and activities in support of industrial research, I welcome the opportunity for meeting the research leaders of Canadian industry and for observing at first hand the impressive growth of the Sheridan Park Research Community.

At the outset, I should like to extend my congratulations and best wishes to the Ontario Research Foundation on the opening today of its outstanding new laboratory building at Sheridan Park. In addition to serving the needs of its neighbours in the Research Community, I am certain that it will make a real contribution to advancing industrial technology in the Province of Ontario, the benefits of which will undoubtedly extend to industries in many other parts of Canada.

At the same time, I should like to pay tribute to the foresight of the founders of the Sheridan Park Research Community, and in particular to the Ontario Research Foundation and its industrial partners who provided the initial stimulus. The imaginative concept of building an industrial research complex around the central facilities of the Ontario Research Foundation





is one which I am sure will pay substantial dividends to all participants and represents a pattern which could be well worth emulating in other industrial centers across Canada.

I first met with the CRMA at its 2nd Annual Conference in Ottawa in 1964 (at which time the new Department of Industry was just becoming operational), and I recall discussing some of our policy problems and plans for encouraging industrial research and development. In the intervening three years, the problems have not disappeared, but two important new programs have been put into effect (viz. PAIT and IRDIA) and I believe some tangible progress has been made. Accordingly, I should like to review the state of industrial research in Canada as reflected in the latest DBS statistics. Dr. Grace suggested that you would also be interested in a comparison of techniques employed for stimulating industrial research in other countries, and I will endeavour to comply with this request, although quantitative data on which to judge the relative effectiveness of the different methods do not yet exist.

Let us then examine the record of research activity (used here in its broader sense to include development) to determine where our industry presently stands and if possible to discern the effectiveness of the federal government's various incentive and assistance programs. The following summary is derived from analyses undertaken by the Industrial Research



Adviser's Office in the Department of Industry and is based on data for the 1965 calendar year supplied by the Dominion Bureau of Statistics.

Current intramural expenditures for R & D performed by Canadian industry increased from \$153 Millions in 1963 to \$234 Millions in 1965 for an average growth rate of 23.6% per annum as compared with a rate of 15.9% between 1961 and 1963. An even more impressive growth was experienced in capital R & D expenditures by industry which almost doubled from \$27 Millions in 1963 to \$50 Millions in 1965. Since these growth rates are very much higher than any experienced previously, I believe we may reasonably attribute the exceptional expansion to the combined effects of the tax incentive and the various R & D assistance programs which were introduced around 1962.

Correspondingly, the number of firms reporting research activity rose from 650 in 1963 to 761 in 1965 and over the same period, professional manpower increased by 10% to 6,341. In absolute terms, the electric and electronics industry was the leading performer followed by the aerospace industry and the chemical industry. Moreover, these 3 industries combined accounted for 55% of the total for all industry.

However, when we examine the research performance of our industry relative to its international competitors, we find that there still remains a formidable gap. On the basis of "research intensity" (i.e. R & D expenditure divided by the value



of net output) Canadian industry as a whole displayed a research intensity of only 1.72% as compared with 2.77 for Sweden, 3.88 for Britain and 6.16 for the United States.

On a sectoral basis, the research investment of U.S. industry exceeded that of Canadian industry by 4.6 times in machinery, 3.0 times in electrical products, and 2.6 times in chemicals and petroleum. Only in paper research did Canadian industry match the U.S., and even here the latter's expenditure was 4 times greater in absolute terms.

Examining the composition of the national scientific effort, we find that two fundamental structural anomalies still persist. The proportion of the total R & D effort performed by industry has only risen from 36% in 1961 to 42% in 1965. This contrasts with an average figure of 66% for the U.S., Britain, Sweden and Japan. In this connection it might be noted that while Canadian industry finances 31% of the national R & D expenditure, its contribution in terms of GNP is barely half that of industry in any of the other nations mentioned above.

Similarly, in terms of distribution of R & D effort, we find that the situation with respect to developmental activity has apparently worsened, falling from 40% in 1961 to 37% in 1965. This is in sharp contrast with the U.S. at 66% and Britain at 62% and would appear to reflect a deficiency in the industrial exploitation of research.





It will be apparent from the foregoing that we still have a long way to go in raising the level of innovation activity in Canadian industry to a competitive standard. Likewise, a much stronger effort will be required to raise the level of developmental activity in order to realize the full economic benefit of our research. By concentrating on the expansion of developmental activity in industry, it would be hoped that the current imbalance in R & D effort between the private and public sectors would be corrected.

Turning now to the second part of my assignment, I will assume that most members of this audience are familiar with the details of our general incentive program (Industrial Research and Development Incentives Act - IRDIA), and the four direct assistance programs (viz. Industrial Research Assistance Program (IRAP), Program for the Advancement of Industrial Technology (PAIT), Defence Industrial Research (DIR) and Defence Development Sharing Program (DDSP). All of these programs are responsive to the needs of industry in that the selection of projects is the responsibility of the entrepreneur and in all cases proprietary rights remain with the firm.

To be eligible for an IRDIA grant, the expenditure has only to qualify as bona-fide research or development and satisfy the test of benefit to Canada as determined by the company's policy for its exploitation. The various assistance programs provide risk capital for specific R & D projects on a sharing



basis. In the case of research projects, outright grants are provided, whereas in the case of development projects, payback is required in the event of commercial exploitation. In no case, however, does the government require security, nor does it acquire equity in the firms concerned or attempt to recover any more than its original contribution to the project plus accrued interest.

Considering first the United States, the extensive use of government contracts for research performed by industry in support of their defence, space or atomic energy programs is well known. Such contracts have undoubtedly raised the level of technology in certain industrial sectors which, as an indirect result, may lead to 'fall-out' in the form of new commercial products. However, this is not a particularly efficient method for the development of products for the commercial market and its suitability to the needs and capabilities of smaller nations is open to question. As an observation, our various research incentive and assistance programs may be regarded as alternative methods for achieving the same purpose by means more appropriate to Canadian needs and resources.

In Britain, the main vehicle for promoting technological development in civil industry is the National Research and Development Corporation which is a crown corporation empowered to invest public funds in the exploitation of specific inventions by private industry. Although originally concerned with the inventions arising from government laboratories, NRDC is now



concentrating its major efforts on "joint ventures" with industry in support of development projects involving advanced technology. In effect, NRDC becomes an equity partner in such joint ventures and, if successful, expects to recover its original investment together with a substantial profit resulting from commercial exploitation. NRDC is presently capitalized at £25 million and is expected to balance its accounts over the long term and to pay interest on funds advanced by the government. Although the NRDC technique is undoubtedly an effective one for special cases, it is by no means as comprehensive in its availability or operation as our IRDIA or PAIT programs.

In France, government planning of the economy (viz. "Plan de Développement Economique et Social" or simply "Le Plan") extends into the field of science and technology. Specific technical goals are established, research and development programs are planned, and appropriate funding allocations are established for both the public and the private sectors. In the basic industries, the government has established Technical Institutes to serve the needs of the industry as a whole and these are financed principally by means of a compulsory fiscal levy on all firms in the industry. More recently, the French Ministry of Industry has introduced a scheme for sharing the costs of technical development projects undertaken by industry which is identical in all essential respects with our PAIT program.

In the Netherlands, government laboratories of the T.N.O. are placed at the disposal of industry to undertake research on a contract basis. Such laboratories are expected to





derive at least 50% of their income from industrial contracts, the balance being provided from public funds for so-called "free" research projects selected by the laboratory. Industrial Research Associations (of which there are many) extensively utilize the services of T.N.O. laboratories rather than building their own facilities. In order to encourage cooperative research of this nature, the T.N.O. actually shares such costs equally with the sponsoring industry research association. The Dutch Ministry of Economic Affairs also administers a program for sharing the costs of major development projects with industry which is very similar to our PAIT program.

While the foregoing is by no means a comprehensive survey of the subject, I believe that it is representative of the principal techniques employed by governments to promote technical innovation in industry. All are designed to foster and expedite the exploitation of science and technology by private industry and have a common economic objective. Although it is too early to draw conclusions as to the relative effectiveness of different schemes, I doubt whether any of the examples cited above are more liberal or comprehensive than those which are available in Canada. The true proof of their effectiveness will, of course, depend on the response of our industry to the opportunities thus afforded. With your cooperation, I am optimistic over the prospects for a major improvement in the innovation performance of Canadian industry.

Before concluding, I should like to discuss some of the environmental factors which are going to exert a profound influence



on the industrial development of Canada over the next decade and their broad implications for our Science Policy, particularly in relation to industry. I do not believe that I will have to argue before this audience, my thesis that the future economic progress of this country depends mainly on the growth and productivity of its manufacturing industry. Unfortunately, as has been pointed out most recently by the Economic Council in its Fourth Annual Review, the productivity of Canadian manufacturing industry is far below that of its major competitors in the United States. Thus, despite a general overall improvement in output per worker, the productivity of Canadian industry has traditionally been behind that of the U.S., and in recent years has been falling further behind. At present it is estimated that productivity in Canada is some 30% below that of the U.S.A. Productivity is a complex of several factors including scale of operation, plant equipment, labour skill, management capability and of course, the level of technology. It is this latter factor which is the root of current concern over the so-called "Technology Gap" between U.S. and European industry. Clearly, we are not going to overcome our 'Productivity Gap' with second-hand technology, and this factor must receive due attention along with the others cited above.

Another important environmental factor is, of course, the progressive reduction of international trade barriers, and the recent "Kennedy Round" of tariff reductions will have a significant impact on Canadian manufacturing industry. While it will intensify the competition facing Canadian manufacturers



in the domestic market, it presents, at the same time an extensive new opportunity to enter export markets. Trade in manufactured goods now constitutes almost 60% of the value of world trade and this proportion is steadily rising. Moreover, the most rapidly growing element of trade in manufactured goods is in the high-technology sector. The conclusion seems therefore that success in export of manufactured goods can most readily be achieved through technological superiority.

An institutional factor affecting the behaviour and performance of Canadian industry is the fact that at least 60% of our manufacturing firms are subsidiaries of foreign parents. While these firms have undoubtedly benefited from the technological and financial support of their parents, they are sometimes inhibited in the exploitation of export markets and limited in their innovative activity. With the culmination of the Kennedy Round tariff reductions, a measure of rationalization of production as between parent and subsidiary appears necessary if the subsidiary operation is to improve its competitive position. Clearly, some form of specialization in product lines would realize the benefits of scale and specialization and permit the subsidiary to make a fuller contribution to the Canadian economy.

In summary, I would like to suggest that new product or process development offers a most promising and practicable method for meeting the challenge of widening export markets, increasing productivity and realizing the full economic potential of our manufacturing industry (whether subsidiary or not). It





is the purpose of our various research incentive and assistance programs to stimulate a major expansion of innovation activity in Canadian industry and thereby bring about a greater degree of specialization to successfully compete internationally. This approach, which has formed a corner-stone of my Department's industrial policy, has, incidentally, been advocated most strongly by the Economic Council in its latest Review.

Finally, let us consider the implications of the foregoing for our National Science Policy. Above all, it seems to me that we must give top priority to scientific and technical endeavour directed toward economic and social goals. For, without a prosperous economy based on an efficient manufacturing industry we cannot afford the luxury of "prestige science" in either the public or the private sector. Therefore, our first obligation is to ensure that technical innovation activity in our industry is brought to an adequate level in the shortest possible time. To this end, the government must emphasize engineering research and developmental activity in both its intramural and extramural programs. At the same time we must support the universities in the important task of training the professional manpower that will be required to staff our industrial laboratories.

In order to attain a more appropriate and effective balance in our total scientific effort, it will probably be necessary to moderate for the present the growth of our expenditures in the public sector in favour of the industrial sector. I am sure that the scientific community will appreciate the difficult



budgetary problems which we now face in financing large scale scientific endeavours and the necessity for establishing rational spending priorities.

Clearly, to succeed in any field we must specialize, and this inevitably involves realistic judgements as to national priorities as a basis for determining the allocation of public funds in support of Science and Technology. We are looking to the newly-formed Science Council of Canada for guidance as to the most profitable lines of scientific endeavour for Canada and the critical appraisal of priorities between competing claims on our limited scientific and financial resources.

I hope that I have been able to tell you, this evening, enough about the objectives and direction of government policy to enable industry to plan its future research activities with confidence and to bring about a better coordination of private and public endeavours in the vital fields of Science and Technology.

In closing, I should like to say how highly I value this opportunity for meeting with the managers of Canadian industrial research as a means of promoting more effective contact between government and industry on matters of national interest. The Canadian Research Management Association provides a forum par excellence for this purpose and I congratulate you on the continuing vigour of your activities and extend my very best wishes for your future success.

technology, particularly in the field of information science.

Scientific research and the necessity for continuing research  
appearing in the field.

Finally, in connection with this, we must also mention, and

this involves, the necessity for continuing research in the field.

It is a matter of fact that the development of scientific

research in the field of science and technology, as we have seen,

the newly-formed Research Council of Canada has shown as the

most important of the various factors for continuing the

critical approach to the field of science and technology.

Our first scientific and technical research.

I hope that I have been able to tell you, this morning,

enough about the objectives and objectives of research in

science and technology to show that there is a need for

continued and in fact, a better coordination of scientific

and scientific research in the field of science and technology.

In closing, I should like to say how highly I value this

opportunity for meeting with the members of the Canadian Research

research as a means of promoting more effective contact between

researchers and the field of scientific research.

Canadian Research Council Research Council provides a forum for

exchange of ideas and information and I am confident that our

vision of the future and the field of science and technology

future research.







